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to adhere as much as possible to the physiological mechanisms that govern the uptake, accumulation and elimination of lead and still use a minimum number of compartments and pathways.

The performance of the model was first tested by calculating steady state organ concentrations to compare to the measured values.

Observed and Predicted Compartmental Concentrations for Experimental Exposures to Young Animals

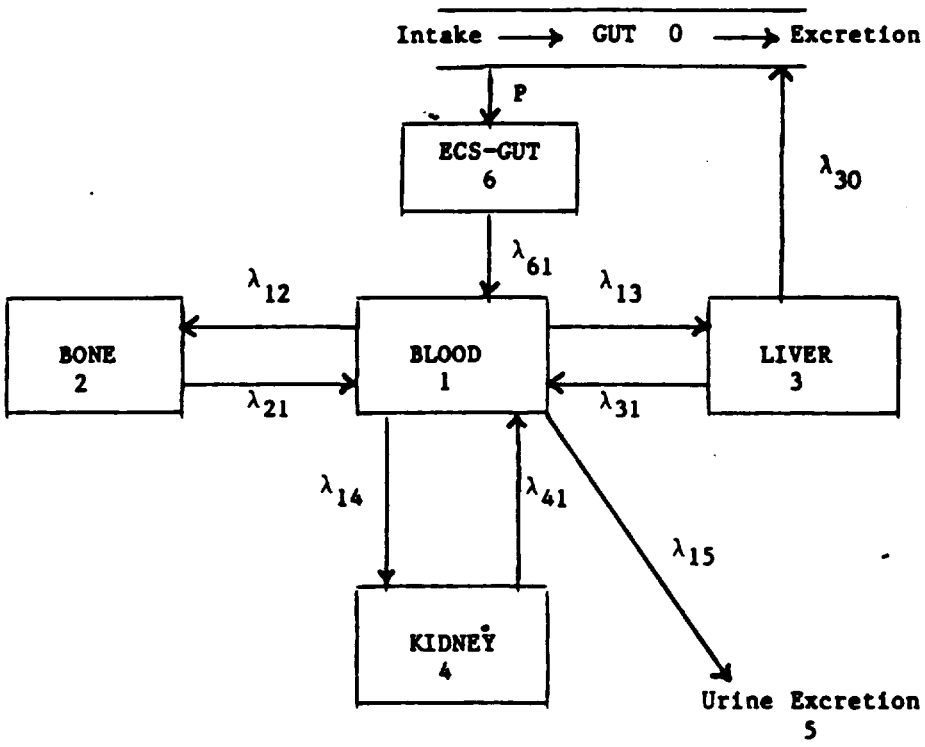
Dose Rate	Blood	Liver	Kidney	Bone
μg Pb $kg^{-1}day^{-1}$	μg%	μg g^{-1}	μg g^{-1}	μg g^{-1}
100				
(observed ± std. error)	32 ± 3	2.6 ± 0.7	2.2 ± 0.7	13.6 ± 4
(predicted)	33	2.9	2.2	12.6
200				
(observed ± std. error)	42 ± 3	3.6 ± 0.7	3.2 ± 0.9	16.5 ± 4
(predicted)	44	3.9	3.0	15.6
1000				
(observed ± std. error)	71 ± 6	6.8 ± 1.0	5.8 ± 1.0	26.5 ± 6
(predicted)	76	6.7	5.2	25.3

The estimated coefficients satisfactorily reproduce the tissue burden values.

The model was applied to environmental intake data for adult humans exposed to a nominal value for 30 years assuming 20% GI absorption to age 10 and 10% thereafter. A bone uptake of 0.34 day^{-1} scaled to 0.11 day^{-1} at age 20 was another factor in this model that was varied with age. This model gives good agreement between observed and predicted adult human organ burdens.

A first order kinetic model appears to fit the observed whole organ burdens well in both baboons fed lead in chronic and short term studies and humans exposed to normal environmental levels. However, the distribution of lead within organs is not known. It would be of considerble interest to pursue this aspect of modeling. It is well known, for example, that different types of bone within the skeleton have different turnover rates and lead reservoirs should vary. Measurement of sectioned organs, with emphasis on bone, perhaps using some of the more sophisticated techniques described in this symposium would provide the needed data.

Figure 1. Schematic of Lead Metabolism in the Baboon with Compartmental Transfer Coefficients for Effective Fitting of Organ Burdens.



λ_{12} = 0.34 (Infant) = 0.11 (Juvenile)

$\lambda_{21} = 1.73 \times 10^{-3}$

λ_{13} = 0.10

λ_{31} = 0.03

λ_{14} = 0.03

λ_{41} = 0.07

λ_{15} = 0.08

λ_{30} = 0.01

λ_{61} = 0.23